

Sub E1
WHAT IS CLAIMED IS:

1. A ball hitting practice apparatus, said apparatus comprising:
 - a substantially rigid member having a first end and a second end;
 - a first hinge that can be suspended from a frame and attached at or near said first end such that said rigid member rotates about a substantially horizontal axis; and
 - a ball mounting assembly suspended from said second end of said member.
2. The apparatus of claim 1 wherein said rigid member is mounted to said hinge such that said second end rotates in a substantially vertical plane.
3. The apparatus of claim 2 wherein said frame has a vertical support structure that is substantially in said plane.
4. The apparatus of claim 1 wherein said rigid member has a weight that is less than a weight of a combination of said ball mounting assembly and a ball attached to said assembly.
5. The apparatus of claim 1 wherein a combination of said rigid member, said ball mounting assembly, and a ball attached to said assembly has a center of gravity that is below said rigid member second end.
6. The apparatus of claim 1 wherein said hinge is secured to said frame.

7. The apparatus of claim 6 wherein said frame comprises a substantially horizontal support onto which said hinge is secured.

8. The apparatus of claim 7 wherein said frame further comprises a substantially vertical support having an upper end and a lower end, and wherein said substantially horizontal support structure has a first end and a second end, said first end of said horizontal support structure being secured near said upper end of said substantially vertical support structure, and wherein said hinge is secured near said second end of said substantially horizontal support structure.

9. The apparatus of claim 7 wherein said frame further includes a base, said substantially vertical support structure being secured to said base for supporting said vertical support structure.

10. The apparatus of claim 9 wherein said base comprises a plurality of legs.

11. The apparatus of claim 10 wherein said legs comprises collapsible legs.

12. The apparatus of claim 7 wherein said substantially vertical support has an adjustable height.

13. The apparatus of claim 12 wherein said substantially vertical support is telescopic to allow adjustment of said height.

14. The apparatus of claim 7 wherein said substantially horizontal support has an adjustable length.

15. The apparatus of claim 14 wherein said substantially horizontal arm is telescopic to allow adjustment of said length.

~~Sub 13~~ 16. The apparatus of claim 1 wherein said ball mounting assembly comprises:

at least one shaft; and

at least one tubular member adapted to rotate around each of said at least one shaft, wherein said at least one tubular member allows for releasable mounting of a ball.

17. The apparatus of claim 16 wherein said shaft comprises an element selected from a group consisting of a rope and a rod.

18. The apparatus of claim 16 wherein a releasable fastener is fixed to at least a portion of said tubular member for facilitating releasable mounting of said ball.

19. The apparatus of claim 18 wherein said releasable fastener comprises two complementary halves, a first of said halves being fixed to said tubular member and a second of said halves being fixed to said ball.

20. The apparatus of claim 19 wherein said releasable fastener comprises a hook and loop type fastener.

21. The apparatus of claim 19 wherein said portion of said tubular member is concave for increasing contact surface between said two halves.

22. The apparatus of claim 19 wherein said releasable fastener comprises a piercing half and a pierceable half.

23. The apparatus of claim 22 wherein said piercing half comprises at least one pointed member and said pierceable half comprises rubber.

24. The apparatus of claim 16 wherein at least one suction cup is secured to said tubular member for detachable mounting of said ball.

25. The apparatus of claim 1 wherein said rigid member has a length that is adjustable.

26. The apparatus of claim 1 wherein said rigid member is a rod comprising a material selected from a group consisting of foam, aluminum, plastic, rubber, a soft material, and any combination thereof.

27. The apparatus of claim 26 wherein said rod comprises an aluminum inner rod and a soft material that surrounds at least a portion of said aluminum rod.

28. The apparatus of claim 27 wherein said rigid member comprises:

an upper elongated portion attached to said hinge; and

a lower elongated portion suspended from said upper portion and capable of movement that is independent from movement of said upper portion.

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29. The apparatus of claim 28 wherein said upper and lower portions are attached together using a ball-and-socket type fastener.

30. The apparatus of claim 28 wherein said upper and lower portions are attached together using a cylinder-and-socket type fastener.

31. The apparatus of claim 29 wherein said upper and lower portions are attached together using at least one hook.

32. The apparatus of claim 1 wherein said hinge comprises:
a first part; and
a second part that is rotatable about said first part and that is attached to said first end of said rigid member.

33. The apparatus of claim 1 wherein said hinge comprises:
a first part that allows said rotation of said rigid member about said substantially horizontal axis; and
a second movable part including a spring element that allows said rigid member to move in and out of a substantially vertical plane.

34. The apparatus of claim 1 wherein said hinge comprises:
a movable part for allowing a swinging motion of said rigid member about said horizontal axis; and
a spring element attached to said rigid member to allows said rigid member to move in and out of a substantially vertical plane.

35. The apparatus of claim 1 wherein said hinge comprises a movable part for allowing a swinging motion of said rigid member in a substantially vertical plane, and wherein said rigid member comprises a spring element to allow a lateral motion of a portion of said rigid member.

36. The apparatus of claim 1 wherein said ball mounting assembly comprises a ball mounting device suspended from said second end of said rigid member.

~~Sub 37~~ 37. The apparatus of claim 36 wherein said ball mounting device comprises:
a tube having a longitudinal axis;
a plurality of extending shafts; and
a plurality of tubular members adapted to rotate around each of said shafts, wherein said at least one tubular member allows for releasable mounting of a ball.

~~Sub E' 37~~ 38. The apparatus of claim ~~37~~³⁶ wherein a releasable fastener is fixed to at least a portion of said tubular member for facilitating releasable mounting of said ball.

~~38~~³⁷ 39. The apparatus of claim ~~38~~³⁷ wherein said releasable fastener comprises two complementary halves, a first of said halves being fixed to said tubular member and a second of said halves being fixed to said ball.

40. The apparatus of claim 1 wherein said ball mounting assembly comprises:
a tether suspended from said second end of said rigid member; and

~~a ball mounting device suspended from
said tether.~~

Sub E17 41. The apparatus of claim 40 wherein said
tether is adjustable in length.

42. The apparatus of claim 40 wherein said
tether comprises an elastic string.

43. The apparatus of claim 40 wherein said
tether comprises a non-elastic string.

Sub E17 42 44. The apparatus of claim 1 wherein said
ball mounting assembly is releasably suspended from
said second end of said rigid member.

45. The apparatus of claim 44 wherein said
ball mounting assembly comprises:
a tether suspended from said second end
of said rigid member; and
a ball mounting device suspended from
said tether.

Sub E17 46. The apparatus of claim 45 wherein said
tether has an upper end with an object attached and
said second end of said rigid member has a passage
adapted to hold said object until said tether has a
tension that is greater than a threshold tension.

47. A method for practicing hitting a ball,
said method comprising:
providing a ball hitting practice
apparatus comprising:
a substantially rigid member having
a first end and a second end,

a tether having an adjustable length, said method further comprising adjusting said adjustable length.

44 59. A ball hitting practice apparatus for use by a hitter, said apparatus comprising:
a frame comprising a base, a substantially vertical support structure secured to said base, and a substantially horizontal support structure having a first end and a second end and being secured to said substantially vertical support;
a hinge secured near said second end of said substantially horizontal support structure;
a substantially rigid member having an upper portion and a lower portion, said upper portion being secured to said hinge such that said lower portion rotates about a horizontal axis; and
a ball mounting assembly suspended from said rigid member lower portion, said assembly comprising:
a tether having an upper end and a lower end, said tether upper end being secured to said lower portion of said rigid member; and
a ball mounting device secured to said tether lower end.

45 60. The apparatus of claim 59 wherein said member is fixed to said hinge such that said member rotates in a substantially vertical plane.

46 61. The apparatus of claim 60 wherein said rigid member is a rod comprising a material selected from a group consisting of foam, aluminum, plastic, rubber, a soft material, and any combination thereof.

47 62. The apparatus of claim 60 wherein said ball mounting device comprises:

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1. The first part of the paper is devoted to the study of the properties of the function $f(x)$ defined by the equation $f(x) = \int_0^x f(t) dt$. It is shown that $f(x)$ is a continuous function and that it satisfies the functional equation $f(x+y) = f(x) + f(y)$.

a hinge capable of suspension from a frame and attached near said first end of said rigid member such that said rigid member rotates about a substantially horizontal axis, and

a ball mounting assembly suspended from said second end of said rigid member;
mounting said ball on said ball mounting device;

positioning said ball at a height;
allowing said ball to fall while attached to said ball mounting device; and
hitting said ball with a hitting device.

48. The method of claim 47 wherein said hitting said ball causes said ball to dismount from said ball mounting device.

49. The method of claim 47 wherein said hitting device is selected from a group consisting of a bat, a club, a racket, a stick, a bare hand, and a gloved hand.

50. The method of claim 47 wherein said positioning includes causing said rigid member to rotate on said hinge about said axis in a substantially vertical plane.

51. The method of claim 47 wherein said positioning comprises raising at least said ball such that said ball is raised to a user-determined height.

52. The method of claim 51 wherein said raising said ball comprises raising said ball mounting assembly by an automated device.

53. The method of claim 47 wherein said hitting said ball comprises hitting said ball while said rigid member rotates.

54. The method of claim 47 wherein said ball is a baseball and said frame has a base and a home plate located on ground below said hinge, and wherein said providing comprises providing said apparatus such that said base of said frame is substantially located behind said home base.

55. The method of claim 47 wherein said providing comprises providing said apparatus with said hinge secured to said frame that comprises a substantially horizontal support.

56. The method of claim 55 wherein said providing comprises providing said apparatus that further comprises a substantially vertical support having an upper end and a lower end, and wherein said substantially horizontal support has a first end and a second end, said first end of said horizontal support being secured near said upper end of said substantially vertical support, and wherein said hinge is secured near said second end of said substantially horizontal support.

57. The method of claim 56 wherein at least one of said substantially vertical and horizontal support structures have a length that is adjustable, said method further comprising adjusting said length to adapt said apparatus to a user.

58. The method of claim 47 wherein said ball mounting assembly comprises a ball mounting device and